What is claimed is :

1. Method for the determination of the acoustic impedance, comprising the steps of

- arranging a probe with a mean for the acoustic stimulation and a microphone at the area to be measured;

- sending out acoustic signals over said mean and receiving again over the microphone;

- transforming the received signals by the microphone into electrical signals and transferring them to an analysis unit, in which the amount of the impedance will be determined;

- using a defined stimulation followed by a chain transfer matrix in form of a twoport until the impedance Z as a calculation base,

- whereby the voltage ratio between stimulation and impedance is described as a dimensionless transfer function in form of a complex function of the stimulation fequency;

- generating a series of acoustic calibration signals by a number of known acoustic impedances covering different calibration scopes by means of the defined stimulation;

- recording the calibration signals received by the microphone and merging the electric values together with the respective voltage values of the stimulation for the evaluation of the results of the respective transfer functions;

- merging together the transfer functions of the calibration signals into a over determined linear system of equations and solving the system of equations and calculating the two coefficients; and finally
- determining the impedance to be calculated by evalutating the transfer function under defined stimulation by use of the coefficients determined by the calibration.

2. Method of claim 1 wherein a loudspeaker is used as a mean for the acoustic stimulation.

3. Method of claim 1 wherein the over determined linear system will be solved in terms of minimum squares.

4. Method of claim 1 wherein at least two different impedances are used.

5. Method of claim 1 wherein a combination of hollow bodys and small tubes with defined dimensions and known impedances are used as calibrating impedances.

6. Method of claim 1 wherein a frequency generator is used for the stimulation, preferably by generating of a broad band signal, preferably a white noise.

7. Method of claim 1 wherein the transfer functions will be calculated by the division of the measured auto power spectrum of the stimulation through the average cross power spectrum between stimulation and impedance to be measured.

8. Method of claim 1 wherein two series connected chain matrix in form of two serial connected twoports are used, whereby the microphone is arranged between both twoports, between the output of the first twoport and the input of the second twoport.

9. Method of claim 8 whereby the elements of the two chain matrices are reduced to three base parameters, which are evaluated by measurements of at least three calibration impedances with known impedances and the respective solution of the over determinded linear system of equation to further determine the impedance to be measured by measuring of the transfer function as a division between the stimulation and the microphone signal by use of the base parameters.

10. Method of claim 9 whereby the linear system of equation will be solved in terms of miminum squares.

11. Method of claim 1 whereby an acoustic resistor is arranged between the stimulation and the microphone.

12. Method of claim 11 whereby the sensitivity of acoustic resistor is optimized with respect to microphone errors.

13. Method of claim 1 whereby a frequency and/or impedance specific weighting of the linear systems of equation will be performed.

14. Method for the determination of the acoustic impedance of cavities, such as the ear in connection with hearing aids, comprising the steps of

- arranging a probe with a microphone and a speaker at the area to be measured;

- sending out acoustic signals over the speaker into the cavity and receiving again over the microphone;

- transforming the received signals by the microphone into electrical signals and transferring them to an analysis unit;

- using a defined stimulation followed by a chain transfer matrix in form of a twoport until the impedance Z as a calculation base,

- whereby the voltage ratio between stimulation and impedance is described as a dimensionless transfer function in form of a complex function of the stimulation fequency;

- generating a series of acoustic calibration signals by a number of known acoustic impedances covering different calibration scopes by means of the defined stimulation;

- recording the calibration signals received by the microphone and merging the electric values together with the respective voltage values of the stimulation for the evaluation of the results of the respective transfer functions;

- merging together the transfer functions of the calibration signals into a over determined linear system of equations and solving the system of equations and calculating and storing the two coefficients; and finally

- determining the impedance to be calculated by evalutating the transfer function by use of the coefficients determined by the calibration.

15. Method of claim 14 wherein two series connected chain matrices in form of two serial connected twoports are used, whereby the microphone is arranged between both twoports, between the output of the first twoport and the input of the second twoport.

16. Apparatus for the determination of the acoustic impedance comprising a probe, a microphone and a speaker, whereby an acoustic resistor is arranged following the speaker in a connecting channel to the microphone or to the exit of the probe respectively.

17. Apparatus of claim 16 whereby a connecting channel is built up within the probe between the speaker and the microphone, leading subsequently to the microphone into an

adapter, which is arranged unlockable with housing of the probe.

18. Method of claim 1 to measure the impedances of hearing devices, part systems of hearing devices and shells of hearing devices, especially of vents.

19. Method of claim 14 to measure the impedances of hearing devices, part systems of hearing devices and shells of hearing devices, especially of vents.

20. Method of claim 1 for measuring the impedances in the field of quality control, preferably the quality control of hearing device transducers, porous bodies, membranes and textiles.

21. Method of claim 14 for measuring the impedances in the field of quality control, preferably the quality control of hearing device transducers, porous bodies, membranes and textiles.

22. Apparatus of claim 16 for the measuring of the impedances of hearing devices, part systems of hearing devices and shells of hearing devices, especially of vents.

23. Apparatus of claim 17 for the measuring of the impedances of hearing devices, part systems of hearing devices and shells of hearing devices, especially of vents.

24. Apparatus of claim 16 for measuring the impedances in the field of quality control, preferably the quality control of hearing device transducers, porous bodies, membranes and textiles.

25. Apparatus of claim 17 for measuring the impedances in the field of quality control, preferably the quality control of hearing device transducers, porous bodies, membranes and textiles.